

A handy device



Radio Frequency Identification (RFID) is actively changing the ITS market, as MICHAEL MODJESKA explains

With the advent of low-power, long-range wireless technology, a new active RFID-based solution is now ready to change fee collection practices for a variety of vehicle-related services, while improving service quality and logistics for municipalities and infrastructure operators.

If you think this sounds like yet another techno-era promise, read on. From what we saw at the recent ITS World Congress in London, and what municipalities and transit authorities have been saying about their real present and future needs, there's clearly something new going on here. This is obvious when you see products like Yadilys, a new-generation wireless device from Mayalys that makes it easy for

people to use and pay for a variety of everyday vehicle-related charges, ranging from traditional toll-taking and parking, to new solutions like tollbooth-free highway fees, vehicle-sharing, carpooling, environmentally conscientious "green point" programs and more.

A little background

Yadilys is designed for people who pay fees and for people (and organizations) who collect fees, as well as national authorities who want to promote environmentally friendly behavior. On the surface, it is basically a wireless e-payment device that is connected directly to local services via a low-cost wireless infrastructure. The unit's

two-way communication ability means that drivers can issue payment simply by pressing a button, and that they can receive local information such as current rates, payment confirmation, and even brief messages.

Obvious applications include payment for bridge and highway tolls, on-street parking, parking lots and garages, and congestion charges. More importantly, it opens the door to an entirely new set of services emerging in urban environments, including seamless charging for road usage by zone, vehicle sharing, and other types of per-usage payment systems.

As traffic conditions worsen in major cities around the world and as increasing vehicle loads continue to

pollute the air and try people's patience, many municipalities and transportation agencies are finding that fees and "green-services" (such as vehicle-sharing and carpooling) are an effective way to moderate the problem. The only piece of the jigsaw missing is the right infrastructure to bring the solution to the public and measure the results.

Today Yadilys is the only system that is flexible and scalable enough to handle the entire range of electronic fee collection scenarios that we are likely to encounter.

Keeping it simple

The idea is simple. Users get a single, lightweight wireless device that they can use to pay for and/or access selected services. The most appropriate technology for this turns out to be a specially adapted RFID solution that offers long battery life and long-range connections.

The device's account can be pre-paid or post-paid, or it can be setup as a credit or debit card reader. Because it is so small it fits easily on a car's sunvisor or in your purse or pocket, and it is fully secure against unauthorized use. A simple interface guides you through transactions intuitively.

When you park your car, for example, all you have to do is press a button to start payment, and another button when you are done. No more fishing for small change to feed the parking meter with. No more playing roulette with parking enforcement as now you are accurately paying for the exact time you are parked.

Plaza-free

Another practical example is free-flow highway tolling – without using toll plazas. RFID readers placed along the highway detect passing vehicles and debit the driver's account for their actual road usage.

While wireless tolling has already been proven to have a huge and immediately positive effect on traffic flow, the required infrastructure is generally extremely expensive, with range limitations due to chosen technology often forcing vehicles to pass only through certain lanes in overloaded toll plazas.

Yadilys overcomes this by using the long-range, wireless Wavenis RFID

technology and very low-cost wireless access points, making it possible to not only detect vehicles at a greater distance, but also to limit the need for expensive gantries and lane restrictions. This same concept is used to implement zone-charge systems in congestion areas. The true breakthrough with Yadilys is that it is a single-source payment solution that covers all of today's vehicle-related charges in one unit.

The operator's perspective

Compared with other existing and proposed systems, Yadilys offers operators many advantages, not the least of which is extremely low-cost infrastructure. The Yadilys backbone is based on a series of

smart repeaters installed throughout the city, toll plaza, or at other strategic zones where fee collection and monitoring are required.

End-user and infrastructure devices use the Wavenis protocol, which is specifically adapted for wireless machine-to-machine communications in which relatively low amounts of data are transmitted. In fee collection applications, for example, transmission is limited to just a few kilobits of data, when compared to video or Wi-Fi, which use up to many megabits/second. Because of this, battery-operated Yadilys devices consume minuscule amounts of power and offer longer connection range.

Wireless network access points,



A Yadilys pole-mounted repeater

whether they are installed along the highway, in parking garages, or on city streets, provide reliable two-way connections with line-of-sight range up to hundreds of meters. The benefit to drivers is possible because of intelligent new systems. For the first time, they actually have the tools at their disposal to obtain difficult measurements in real-world situations.

For example, in on-street parking installations, one of the most noteworthy features made possible by the Yadilys RFID system is that, with the regular transmission of data by each parked vehicle, remote operators can monitor statistics and usage patterns that would otherwise be impossible. When you press the button to start paying for parking, a network repeater captures the signal and forwards the information in real-time on to a remote payment transaction server.

Yadilys keeps the server updated on how long you are parked by regularly sending identifying information over the wireless network.

The rest of your day

At the risk of sounding futuristic, with Yadilys the rest of your day will go something like this. When you take the highway to another city, you get charged for your exact use of the

road. The city you are going to implements a congestion charge, and you seamlessly pay the fee precisely for the areas you use. After parking your car, you use Yadilys to reserve and rent a bicycle that the local transit authority or parking garage has put at your disposal, paying of course only for the real time you use it.

If your city is one of those that has opened its car-sharing (short-term car rental) service, you can use Yadilys to locate and reserve an available car, then open the door and drive away using the unit's electronic RFID key, scoring "green points" along the way for using a pollution-efficient system. The reality is that all of these examples are being implemented around the world today, and it's just a matter of time before we can enjoy their long-term benefits.

Conclusion

The most obvious markets for Yadilys today are those that are the most prevalent in people's daily lives. This includes omnipresent on- and off-street parking fees, bridge tolls and congestion charges. Some of

the most interesting applications are for innovative vehicle-sharing and green-point scoring applications.

With a low-cost wireless infrastructure that is easy to manage, operators have no trouble deploying solutions that reap immediate benefits in terms of improved efficiency and more accurate remote monitoring.

Not only that, but they can leverage the wireless infrastructure deployed for one type of service to support another type of service later on. A municipality can deploy an e-payment solution for on-street parking today, and then add a congestion charge or car-sharing service with only a limited marginal investment.

Additional services simply piggyback on the Yadilys infrastructure deployed for the first service. This is actually helping authorities and operators think not only about how to modernize their current collection mechanisms, but how to offer innovative new services in the near future with a single compatible system. **TH**

Mayalys is seeking partners to fully address the North American market. For more information visit www.mayalys.com or contact michel.gilmour@mayalys.com



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